All-Payer Analysis of Variation in Health Care in Maine

Dirigo Health Agency's Maine Quality Forum & The Advisory Council on Health Systems Development

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Health Dialog
2/27/09

Health Dialog

Agenda

- **Framework**
- **Methodology**
- **Results**
- **Conclusions**

Framework

- **Unwarranted Variation:** As defined by the Dartmouth Atlas, inappropriate delivery of services due to under-use, overuse, and/or misuse of care, and can be categorized into three domains
  - **Effective Care and Patient Safety**: Services of proven clinical effectiveness derived from randomized controlled trials, or well-constructed observational studies. These are the traditionally defined 'quality' measures
  - **Supply-Sensitive Care**: Care that is strongly correlated with healthcare system resource capacity and is an indicator of the efficiency of the healthcare system
    - Recent studies have found that patients obtaining care in inefficient healthcare systems that deliver high levels of supply sensitive care have higher mortality than patients obtaining care in efficient systems (Fisher et al. 2003)
  - **Preference Sensitive Care (PSC)**: care for which the treatment options carry significant tradeoffs in terms of risks and benefits for the patient and there is limited clinical evidence favoring one option over another
- **Potentially Avoidable (PA) Admissions**, which consists of 2 components:
  - **Ambulatory Care Sensitive Conditions,** which are inpatient hospital admissions that could be avoided through better outpatient care
  - **Supply-Sensitive Care Admissions**
  - **Frequent examples include: admissions for respiratory infections, COPD, pneumonia, heart failure, angina, peptic ulcers, asthma, complications from diabetes, and other digestive diagnosis**

Framework

- Documentation of dramatic geographic variation in health care spending is not new
- WHAT IS NEW - Analysis of specific high-cost inpatient and outpatient categories
  - Quantification of specific PA high-cost inpatient services
  - Quantification of specific outpatient services with high variation and high cost
  - Specification of services suggests targeted interventions
  - Analysis of high-cost populations suggests broader strategic interventions

Methodology

- **HDAS received claims for the following payers:**
  - Medicare (Data 1/1/2003 -12/31/06)
  - Medicaid (Data 1/1/2003 – 12/31/06)
  - Various Commercial Payers (Data 1/1/2003 – 12/31/07)
- **Analysis was based on the period 11/1/2005 – 10/31/2006**
  - MaineCare and Medicare data had significant claims lag for Nov and Dec 2006; this period was chosen because it was the most recent full annual period
- **MaineCare data is based on incomplete/unreconciled payments**
  - True-up for 2006 has not yet occurred
- **HD analyzed only those individuals with continuous eligibility (at least 11 months of eligibility during the 12 month period of analysis)**
- **Analysis focused on individuals with Commercial, MaineCare, Medicare, or those with both Medicare and MaineCare (dual-eligibles) coverage,**
- **Only "Traditional Medical Expenses" were included in the analysis**
  - IP, OP, ER, costs
  - Does not include MaineCare "other" costs (SNF, LTC)
  - Does not include RX costs due to lack of Part D data, MaineCare rebates, etc.

Methodology

	Maine	
Category	**Population Count**	**Percentage of Total**
Total People/Individuals in HD Database with at least 1 month of eligibility in 2006	**1,094,078**	**100%**
People/Individuals without ≥ 11 months of eligibility	288,569	26%
Continuously eligible People/Individuals in 2006	**805,509**	**74%**
Populations excluded from analysis:		
People/Individuals with Medicare and Commercial Coverage	47,238	4%
People/Individuals < 65 years of age with Medicare Coverage	17,190	2%
People/Individuals with "All" Payers	4,977	0%
Medicaid People/Individuals 65+	3,263	0%
People/Individuals with Medicaid and Commercial Coverage	4,888	0%
Total People/Individuals included in Analysis	727,953	67%

Maine Claims Warehouse: Total Dollars & Per-Capita Dollars

	Commercial	Medicare	Medicaid	Dual	Total
Members	380,015	102,958	191,756	53,224	727,953
IP Costs	$ 311,538,012	$ 220,591,642	$ 204,628,315	$ 179,263,517	$ 916,021,487
ER Costs	$ 56,572,629	$ 8,357,102	$ 43,808,546	$ 11,038,210	$ 119,776,487
OP Costs	$ 674,364,868	$ 173,062,927	$ 292,883,542	$ 175,865,957	$ 1,316,177,293
RX Costs[1]	$ 193,731,829	$ 6,097,701	$ 157,460,155	$ 35,552,202	$ 392,841,887
Traditional Medical Costs[2]	$ 1,236,207,338	$ 408,109,372	$ 698,780,558	$ 401,719,886	$ 2,744,817,154

	Commercial	Medicare	Medicaid	Dual
IP PMPY	$ 822	$ 2,144	$ 1,072	$ 3,356
ER PMPY	$ 149	$ 81	$ 230	$ 207
OP PMPY	$ 1,780	$ 1,682	$ 1,535	$ 3,292
Total Paid PMPY	$ 2,752	$ 3,907	$ 2,837	$ 6,855

[1]Rx data for Medicare Part D was not received, rebate dollars for MaineCare not identified
[2]There are additional Healthcare spending dollars that do not naturally align with the Traditional Medical spending categories (SNF, LTC etc.) and are not included in this analysis

Note: HD focused on IP and OP costs as separate study on ER costs is ongoing

Results: Summary

- **Utilization is the primary driver of cost and much is unwarranted**
- **Inpatient Costs: There is significant variation in total admissions and PA admissions across the State**
  - PA admissions account for a significant portion of all admission costs
  - The volume of PA admissions across State Hospital Service Areas (HSAs) varies by type and is not explained by illness
  - Maine residents across HSAs who have chronic conditions account for a high percentage of health care spending and a majority of inpatient spending
    - The majority of this inpatient utilization falls into the category of "potentially avoidable"
- **Outpatient Costs: there is significant variation in outpatient spending throughout Maine, much of it can be reduced**
  - The top five categories of outpatient spending amenable to interventions make up approximately 23% of outpatient spending
  - The remainder of outpatient spending is evenly distributed among numerous categories
- **Savings Projections**

Cost

COST = # of Services (utilization) X Price/Service
65% 35%

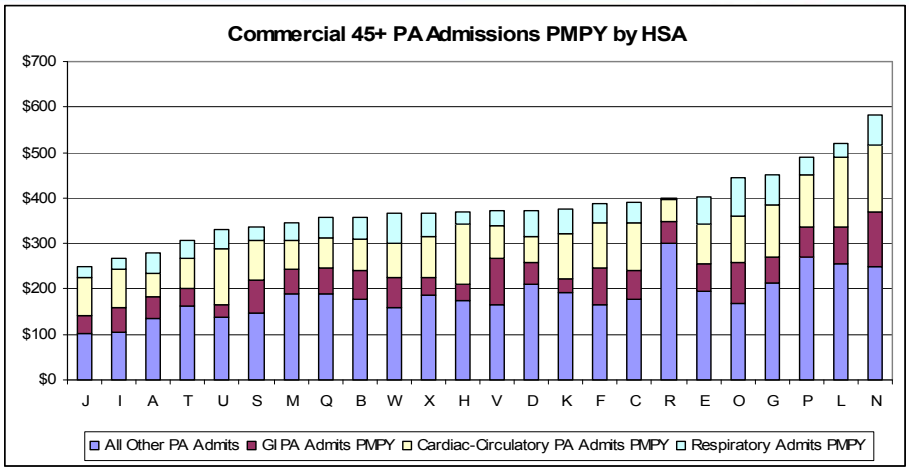
Results: $284 Million dollars of inpatient costs are potentially avoidable

Type of Admission	$ Total IP	% of total IP	$ Total PA IP	% of total PA IP
Cardiac-Circulatory	$193.3M	21.1%	$56.5M	19.9%
Musculoskeletal	$114.5M	12.5%	$18.1M	6.4%
GI	$86.9M	9.5%	$37.2M	13.1%
Respiratory	$72.4M	7.9%	$52.0M	18.3%
All Other	$448.9M	49.0%	$119.8M	42.3%
Total	$916.0M	100%	$283.6M	100%

PA admissions account for about 1/3 of all admission costs

- The top 3 types of PA admissions (Respiratory, Cardiac and GI) make up 51% of all PA admissions ($145.7M)

Potentially avoidable spending *and* categories of PA spending vary among HSAs*



- PA Admissions for Commercial 45+ Individuals vary among HSAs ($250 - $600)
- Variation in specific categories of PA admits is not consistent across HSAs

***Adjusted for age, sex, and illness**

Significant savings are available with each PA category

Type of Admission	Total PA Cost	Savings with 25% Reduction	Savings with 50% Reduction	Savings with 75% Reduction
Cardiac-Circulatory	$56.5M	$14.2M	$28.3M	$42.4M
Musculoskeletal	$18.1M	$4.5M	$9.1M	$13.5M
Respiratory	$52.0M	$13.0M	$26.0M	$39.0M
GI	$37.2M	$9.3M	$18.6M	$27.9M
Sub-Total top 4 PA Admission Types	$163.8M	$41.0M	$82.0M	$122.8M
All Other	$119.8M	$30.1M	$59.9	$89.9M
Total	$283.6M	$71.1M	$141.8M	$212.7M

Note: Savings are *annual* and calculated only for those individuals included in analysis. Total savings for the entire state would be higher.

Significant PA savings are available by Payer

Payer	Total PA PMPY	Savings with 25% Reduction	Savings with 50% Reduction	Savings with 75% Reduction
Commercial	$83.4M	$20.9M	$41.7M	$62.6M
Medicaid[1]	$51.6M	$12.9M	$25.8M	$38.7M
Medicare	$78.2M	$19.7M	$39.1M	$58.7M
Dual	$70.4M	$17.6M	$35.2M	$52.8M
Total	$283.6M	$71.1M	$141.8M	$212.7M

[1] Medicaid is based on estimated paid amounts; savings likely to be higher

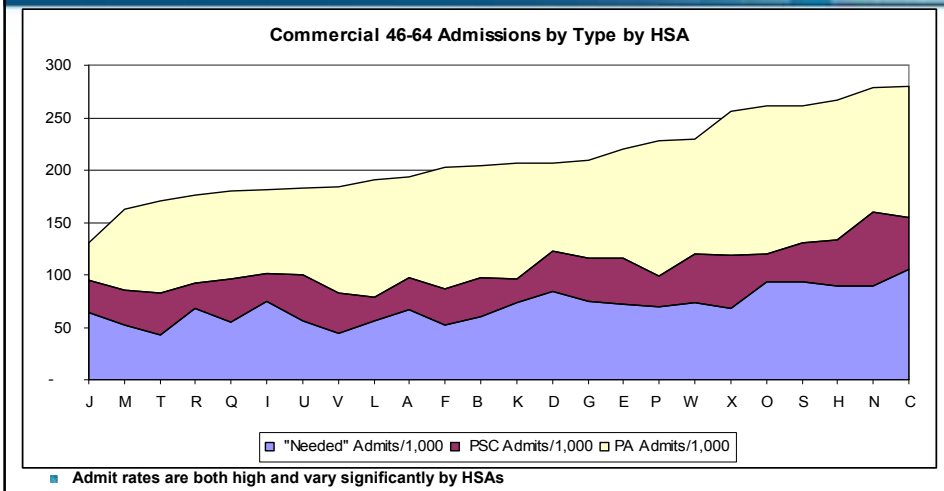
Note: Savings are *annual* (not one-tine only) and calculated only for those individuals included in analysis. Total savings for the entire state would be higher.

Who are the people whose admissions are avoidable?

	COMMERCIAL			MEDICAID			MEDICARE		
Data	Total Pop.	Chronic Pop.	Chronic Impact	Total Pop.	Chronic Pop.	Chronic Impact	Total Pop.	Chronic Pop.	Chronic Impact
# of People	380,015	40,033	11%	191,756	22,826	12%	102,958	33,292	32%
Total Costs									
TOTAL	$1,042,475,509	$289,017,986	28%	$ 541,320,403	$161,834,241	30%	$ 402,011,671	$ 253,649,203	63%
IP Costs	$ 311,538,012	$125,434,487	40%	$ 204,628,315	$ 73,159,348	36%	$ 220,591,642	$ 159,099,399	72%
ER Costs	$ 56,572,629	$ 12,241,013	22%	$ 43,808,546	$ 11,562,013	26%	$ 8,357,102	$ 5,135,343	61%
OP Costs	$ 674,364,868	$151,342,485	22%	$ 292,883,542	$ 77,112,880	26%	$ 173,062,927	$ 89,414,461	52%
Per-capita Costs									
TOTAL	$ 2,770	$ 7,317	2.6	$ 2,918	$ 7,175	2.5	$ 3,989	$ 7,823	2.0
IP Costs PMPY	$ 822	$ 3,143	3.8	$ 1,119	$ 3,187	2.8	$ 2,139	$ 4,782	2.2
ER Visit Costs PMPY	$ 149	$ 307	2.1	$ 228	$ 505	2.2	$ 81	$ 154	1.9
OP Visit Costs PMPY	$ 1,780	$ 3,792	2.1	$ 1,541	$ 3,360	2.2	$ 1,680	$ 2,687	1.6
IP Utilization									
Total Admits/1,000	67	211	3.2	129	366	2.8	231	505	2.2
PA Admits/1,000	24	109	4.6	44	201	4.6	129	303	2.3
PSC Admits/1,000	6	30	4.6	4	18	4.7	35	65	1.9
"Needed" Admits/1,000	37	72	2.0	81	147	1.8	67	137	2.0

- **Individuals with chronic disease account for a high proportion of health care spending, particularly with the Medicare population**
- **Individuals with chronic disease are significantly more expensive on a per-capita basis than the general population**
- **Individuals with chronic disease have significantly higher inpatient utilization than the general population**

PA admissions are high and variable



- **Admit rates are both high and vary significantly by HSAs**
- **Preference sensitive care admissions exist more for Commercially insured than for Medicaid**
- **The "needed" admits are a lower percentage of total admission than Medicaid**
- **"potentially avoidable" admissions rates are high in all HSAs and drive much of the variation**

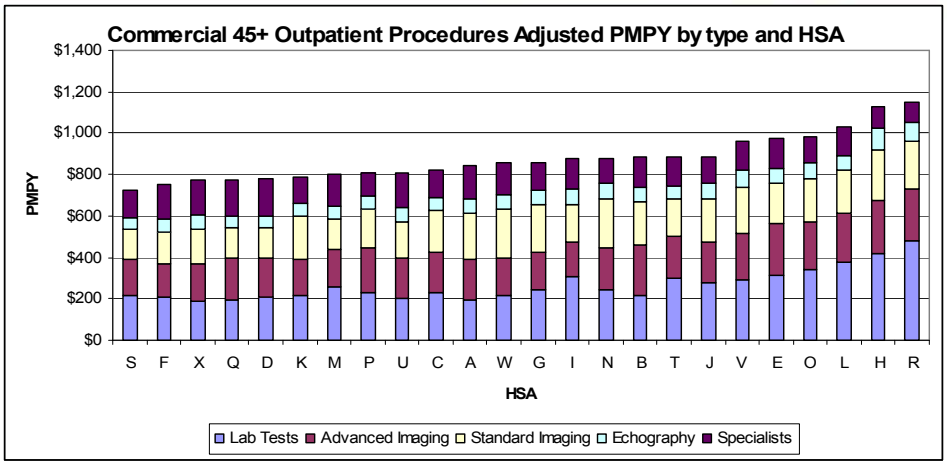
Wide variation in outpatient costs suggests potential savings

HD focused analysis on high cost, high variation OP services that may be amenable to an intervention:

Type of Service	Commercial	Medicaid[1]	Medicare	Dual	Total	% of OP cost
Total OP Costs	$674.4M	$292.8M	$173.1M	$175.9M	$1,316M	100%
Lab Tests	$58.8M	$9.6M	$13.5M	$7.7M	$89.6M	6.8%
Advanced Imaging	$45.3M	$8.4M	$8.0M	$4.9M	$66.6M	5.1%
Standard Imaging	$35.6M	$4.1M	$8.4M	$4.0M	$52.1M	4.0%
Echography	$19.5M	$6.6M	$4.3M	$2.0M	$32.4M	2.5%
Specialist Visits	$40.9M	N/A	$15.3M	$7.9M	$64.1M	4.9%
Total High Cost & High Variation	$200.1M	$28.7	$49.5M	$26.5M	$304.8M	23.3%

[1]Medicaid OP data has a high percentage of missing procedure codes, with additional research could be attributed to other costs

Variation in outpatient spending driven by lab tests*



- Commercial 45+ High Cost, High Variation OP procedures vary among HSAs in total and by type of PA Admission ($650 - $1,100)

***risk-adjusted**

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Savings are available in each outpatient category

Type of Service	OP Costs	Savings with 10% Reduction	Savings with 25% Reduction	Savings with 50% Reduction
Lab Tests	$89.6M	$9.0M	$22.4M	$44.8M
Advanced Imaging	$66.6M	$6.7M	$16.7M	$33.3M
Standard Imaging	$52.1M	$5.2M	$13.0M	$26.0M
Echography	$32.4M	$3.2M	$8.1M	$16.2M
Specialist Visits	$64.1M	$6.4M	$16.0M	$32.1M
Total	$304.8M	$30.5M	$76.2M	$152.4

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Savings are available for each payer

Type of Service	OP Costs	Savings with 10% Reduction	Savings with 25% Reduction	Savings with 50% Reduction
Commercial	$200.1M	$20.0M	$50.0M	$100.1M
Medicaid	$28.7M	$2.9M	$7.2M	$14.3M
Medicare	$49.5M	$5.0M	$12.4M	$24.8M
Dual	$26.5M	$2.6M	$6.6M	$13.2M
Total	$304.8M	$30.5M	$76.2M	$152.4

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Overall Inpatient and Outpatient Savings

Inpatient Savings	Savings from 25% Reduction	Savings from 50% Reduction	Savings from 75% Reduction
Total	**$71.1M**	**$141.8M**	**$212.7M**

Outpatient Savings	Savings from 10% Reduction	Savings from 25% Reduction	Savings from 50% Reduction
Total	**$30.5M**	**$76.2M**	**$152.4M**

Total Savings	$101.6M	$218M	$365.1M
Savings as a % of total inpatient & outpatient dollars	**4%**	**9%**	**16%**

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Strategic Options

- **Public Health – incidence of chronic disease is amenable to prevention strategies**
- **P4P/incentive-based payments – in addition to payment for quality, include efficiency measures in P4P programs**
- **Reporting (to public and/or providers) – provide information on cost drivers to the public (via web) to influence behavior and/or share directly with providers to influence behavior**
- **Regulatory Reform/Amend CON process – base approvals on utilization rates and/or reduce supply in high-utilizing areas**
- **Network Design/Tiered Networks – provide incentives to consumers to drive utilization toward high quality and efficient providers**
- **Health System Development/Infrastructure Support – identify components of high quality and efficient "systems" of care (EMRs, e-prescribing, care-coordination, 24/7 coverage, care management, etc.), redirect funding for infrastructure *AND* implementation and operations**
- **Support fundamental payment reform – shift reimbursement from current pay-for-activity model to pay-for-value model**
  - Can be incremental approach with a goal of global payment, i.e., fee-for-service with a Medical Home payment – global fee for primary care – global DRG hospital case rate – global DRG case rate for hospital and post-acute care – global payment

Focus on (1) short and (2) long-term cost-saving opportunities

1. **Focus on specific inpatient admissions types and outpatient services that are both high cost and high variation**
   - P4P
   - Physician and/or public reporting
   - Regulatory/CON reform
2. **Focus on populations and systemic issues that are driving costs**
   - Network Design/Tiered Networks
   - Health System Development/Infrastructure Support (i.e., Medical Home)
   - Payment Reform

Driving new strategies to improve quality and efficiency

Interventions/Strategies

Existing cost reduction strategies have had little or negative impact on quality and cost increases

- **Reduce payments to providers (MDs, hospitals, health systems, etc.)**
- **Reduce eligibility for publicly financed health insurance**
- **Shift costs to employers (premium increase) or employees/beneficiaries /consumers (co-pays and deductibles)**
- **Reduce benefits to employees/beneficiaries /consumers**

Challenge/Risk

Implementation of new strategies depends on goals and willingness of stakeholders

- Support fundamental payment/ contracting reform, basis for global payment, shared-savings, risk-based contracting
- Health system development/ infrastructure support
- Network Design/ Tiered Networks
- Regulatory reform/ CON process
- Reporting (to public and/or providers)
- Support new incentive-based payment schemes (P4P, quality & efficiency)

Impact Potential (− / +)

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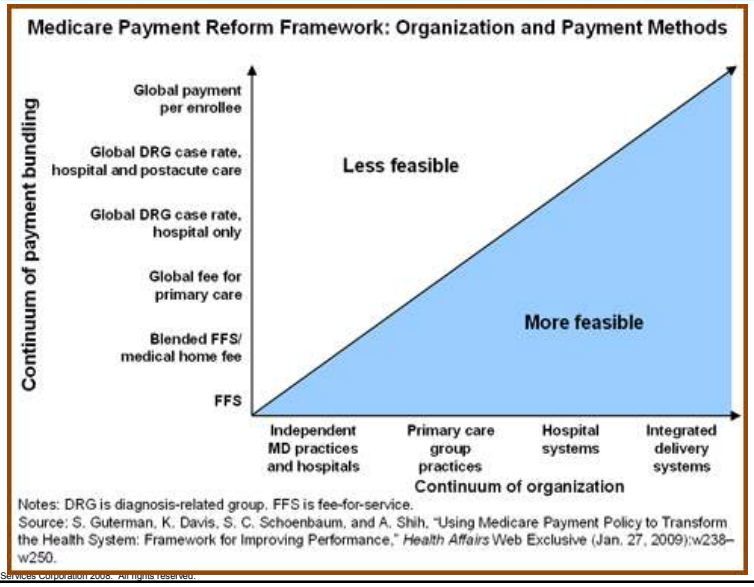
Payment Reform Approach: Meet the providers where they are



Notes: DRG is diagnosis-related group. FFS is fee-for-service.
Source: S. Guterman, K. Davis, S. C. Schoenbaum, and A. Shih, "Using Medicare Payment Policy to Transform the Health System: Framework for Improving Performance," *Health Affairs* Web Exclusive (Jan. 27, 2009):w238–w250.

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APPENDIX

- **Additional definitions**
- **Additional inpatient**
- **Additional outpatient**
- **Value of claims data**

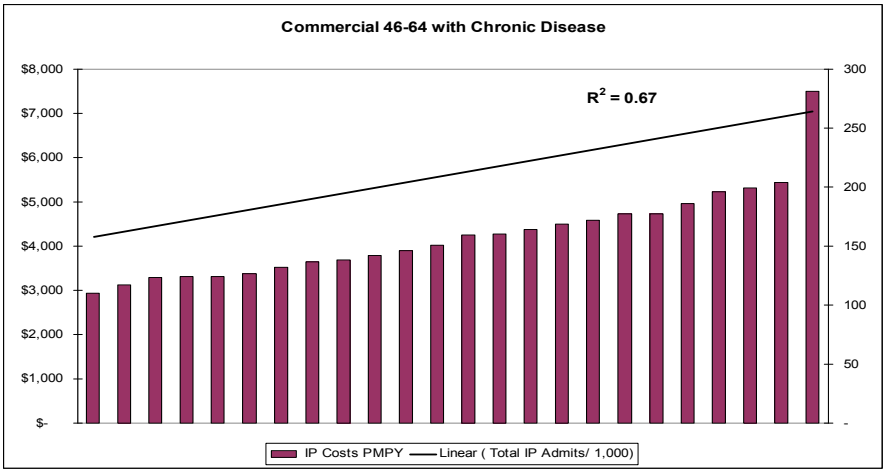
Definitions

- **HSA**: Hospital Service Area - Hospital service areas (HSAs) are local health care markets for hospital care. An HSA is a collection of ZIP codes whose residents receive most of their hospitalizations from the hospitals in that area.
- **Traditional Medical Costs**: Inpatient (IP), Outpatient (OP), Emergency Room (ER), and Pharmacy (Rx) costs
- **Non-Traditional Costs**:
  - **Long-term Care Costs**
  - **Skilled Nursing Facility Costs**
  - **'Other' Costs**, including: all claims that do not have a valid CPT code, mainly found in Medicaid, such as homecare services, HBCS waivers, federally qualified health centers, case management, mental health, and early intervention
- **Risk-Adjusted Methodology**: adjusts for age, sex, and underlying health of populations. HCC risk adjustment by diagnoses codes based on diagnoses of condition. Similar methodology to CMS.
  - Note that the risk-adjustment was done by payer, not across payers
- **Physician Unknown**: Type of physician cannot be determined due to missing or incomplete codes in claims data
- **Chronic Conditions**: Asthma, Coronary Heart Disease, Chronic Obstructive Pulmonary Disease, Diabetes, and Heart Failure

COST = PRICE X UTILIZATION

35% 65%

Relationship between inpatient utilization and inpatient per-capita spending - Commercial



- While not perfectly correlated, those HSAs with higher inpatient admission rates tend to have higher inpatient per-capita spending

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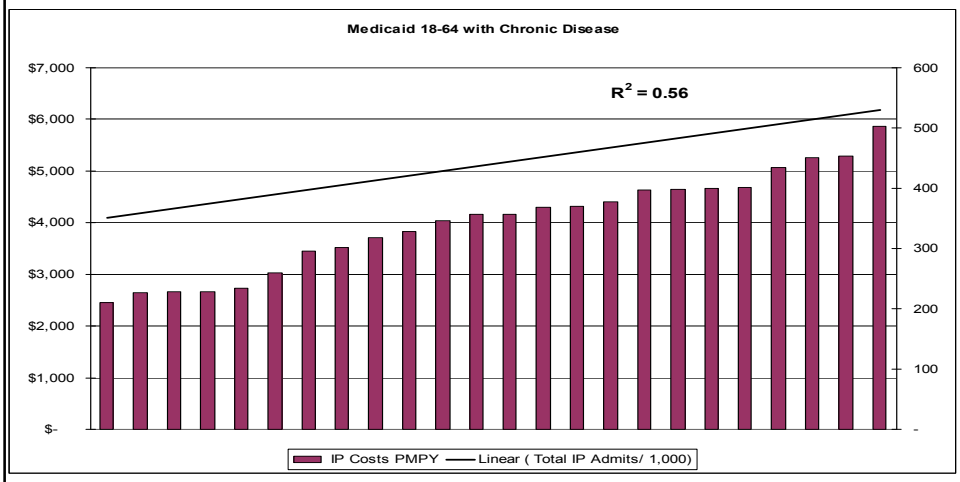
Results: Utilization is the more significant driver of cost - Medicaid

Relationship between inpatient utilization and inpatient per-capita spending - Medicaid



- While not perfectly correlated, those HSAs with higher inpatient admission rates tend to have higher inpatient per-capita spending

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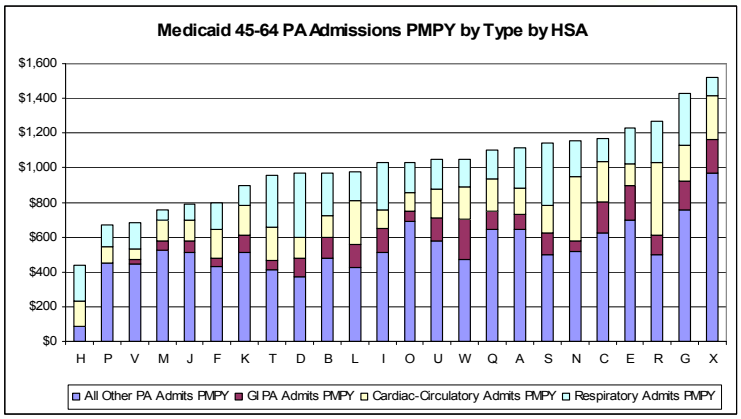
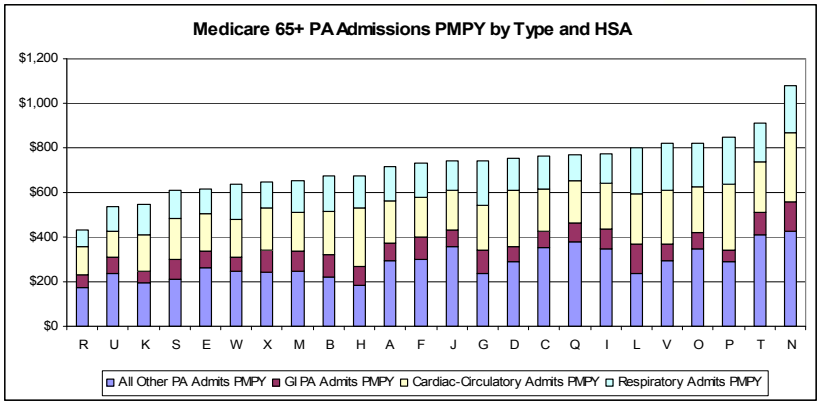
Medicaid PA Admissions Adjusted PMPY by HSA



- PA Admissions for Medicaid 46-64 Individuals vary among HSAs in total and by type of PA Admission ($400 - $1,500)
- Total PA spend for Medicaid 46-64 is $24.4M

Medicare 65+ PA Admissions Adjusted PMPY by HSA



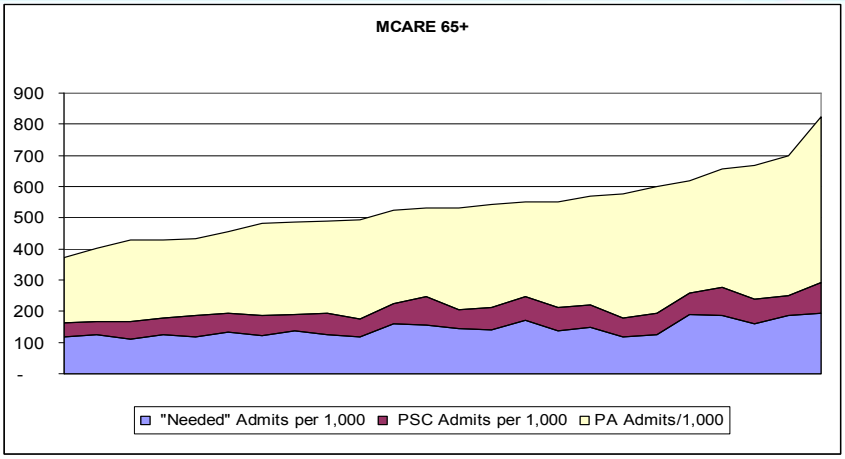
- PA Admissions for Medicare 65+ Individuals vary among HSAs in total and by type of PA Admission ($400 - $1,000)
- Total PA spend for Medicare 65+ is $78.2M

Impact of Chronic Disease on Cost and Utilization by Age

Chronic Impact	0-17	18-45	46-64	65+
% of Pop	7%	8%	18%	31%
% of IP Costs	15%	22%	58%	72%

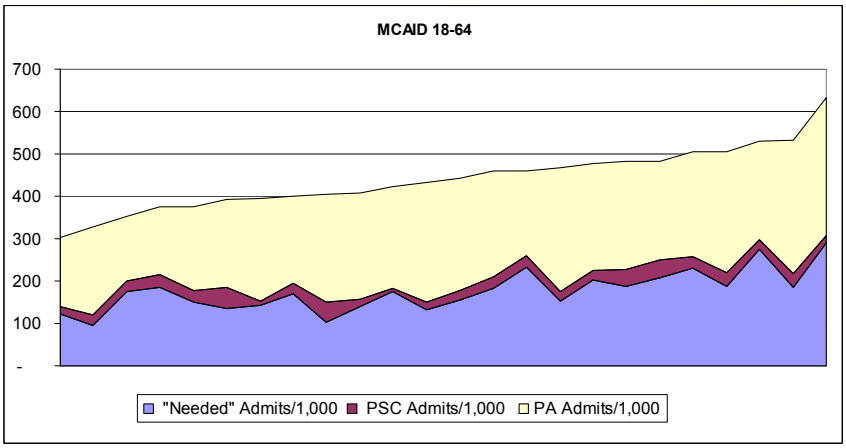
- Age plays a large role both in terms of chronic disease prevalence and in terms of impact on inpatient dollars
- Analysis to focus on adult populations

Inpatient Admission Rates by HSAs for individuals with chronic disease - Medicare



- Admit rates are both extremely high and vary significantly by HSAs
- Preference sensitive care admissions exist but appear consistent across HSAs
- The "needed" admits are a lower percentage of total admission than Medicaid and Commercial
- Most of the variation appears to be driven by "Potentially Avoidable" admit rates

Inpatient Admission Rates by HSAs for individuals with chronic disease - Medicaid



- **Total admission rates are both high and vary significantly by HSAs**
- **Little preference sensitive care admissions exist for the Medicaid population**
- **The "needed" admits largely reflect maternity**
- **"Potentially avoidable" admissions rates are high in all HSAs**

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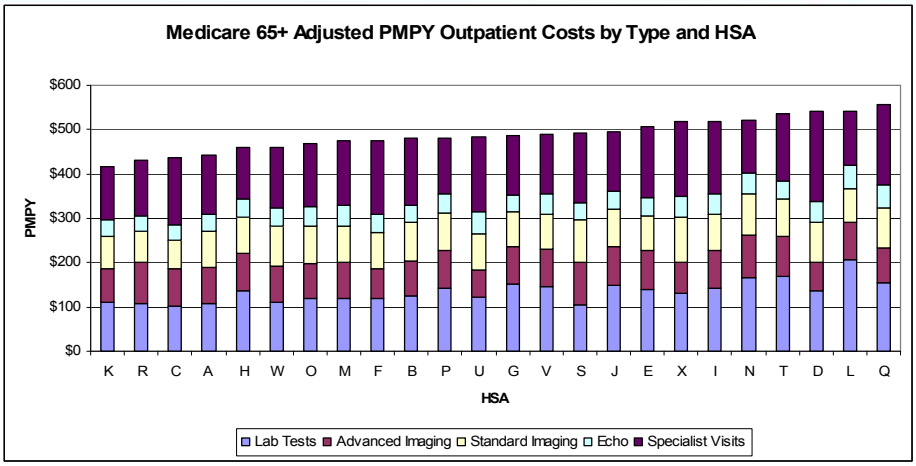
Medicare 65+ Outpatient Adjusted PMPY vary by HAS and by type



- Medicare 65+ High Cost, High Variation OP procedures vary among HSAs in total and by type of PA Admission ($400 - $550)

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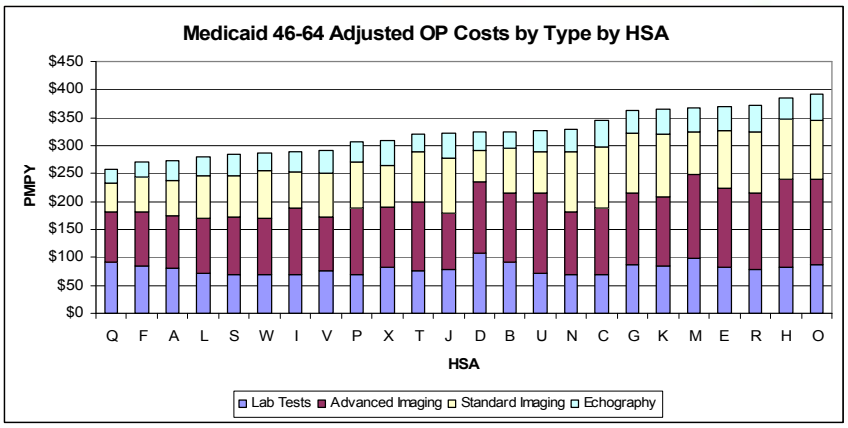
Medicaid 45-64 Outpatient Adjusted PMPY by type and HSA



- Medicaid 46-64 High Cost, High Variation OP procedures vary among HSAs in total and by type of PA Admission ($250 - $4,000)
- Based on *estimated* costs, true up has not yet occurred

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Using Claims Data for Healthcare Analyses

Benefits

- Shown to have a high congruence with medical record data compared to patient surveys
- Useful for evaluating health outcomes in non-experimental settings and generalizing results to broader populations
- Provide a variety of information
  - Patient demographics
  - Medical care episodes
  - Healthcare utilization, for specific medical conditions and procedures, for large numbers of patients over extended periods of time
  - Cost estimates
  - Outcomes that can be measured more globally than is possible with randomized controlled trials (RCT) data
- Practical and relatively inexpensive alternative to RCTs

Challenges

- Data quality, completeness, and detail
- Combining data sets with different formats and codes
- Limited information on providers and occasions of service

Sources:
Birnbaum HG, et al. "Using Healthcare Claims Data for Outcomes Research and Pharmacoeconomic Analyses." PharmacoEconomics. 1999; 16(1): 1-8.
Fowles, JB et al. "Comparing claims data and self-reported data with the medical record for Pap smear rates. *Eval Health Prof.* 1997;20(3):324–42.
Fowles, JB et al. "Validation of claims diagnoses and self-reported conditions compared with medical records for selected chronic diseases." *J Ambul Care Manage.* 1998;21(1):24–34.
Tyree PT, et al. "Challenges of Using Medical Insurance Claims Data for Utilization Analysis." *Am J Med Qual.* 2006; 21(4): 269–275.

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